

CLAIMS

1. An apparatus for the optical separation of the emission and reception light paths of a monostatic LIDAR, said apparatus comprising:

- a laser source (1) emitting a beam of light with linear polarization;
- a first polarizing beam splitter (2) oriented to transmit towards the Faraday rotator (3) substantially all the light emitted by said source (1);
- a Faraday rotator (3) applying a 45° polarization plane rotation;
- a second polarizing beam splitter (4), rotated through an angle of 45° with respect to said first polarizing beam splitter (2), around the light propagation direction;
- an optical system (5), or telescope, for the transmission and reception of the light to/from the atmosphere;
- two detectors (6) and (7), with related electronics, collecting the backscattered light collected by said optical system (5) and routed towards them by the two polarizing beam splitters (2) and (4);

characterized in that:

- substantially all the light emitted by said laser source (1) is routed by the two polarizing beam splitters (2) and (4) and by the Faraday rotator (3) towards the telescope (5) and not in other directions;
- substantially all the backscattered light collected by said optical system (5) is routed by the two polarizing beam splitters (2) and (4) and by the Faraday rotator (3) towards the detectors (6) and (7), and not in other directions.

2. The apparatus claimed in claim 1, characterised in that said apparatus is only made by solid-state elements.

3. The apparatus claimed in claim 1, characterised in that:

- the light sent in the atmosphere is linearly polarized; and
- said laser source is also isolated from the light backscattered by any element placed after said apparatus.

4. A method for optical separation of the emission and reception light paths of a monostatic LIDAR, based on the apparatus claimed in claim 1, consisting of the following steps:

- sending in the atmosphere a light having a linear polarization; and
- 5 • maximising the detection of the backscattered light maintaining the same linear polarization as the emitted light after the back reflection by the atmosphere.